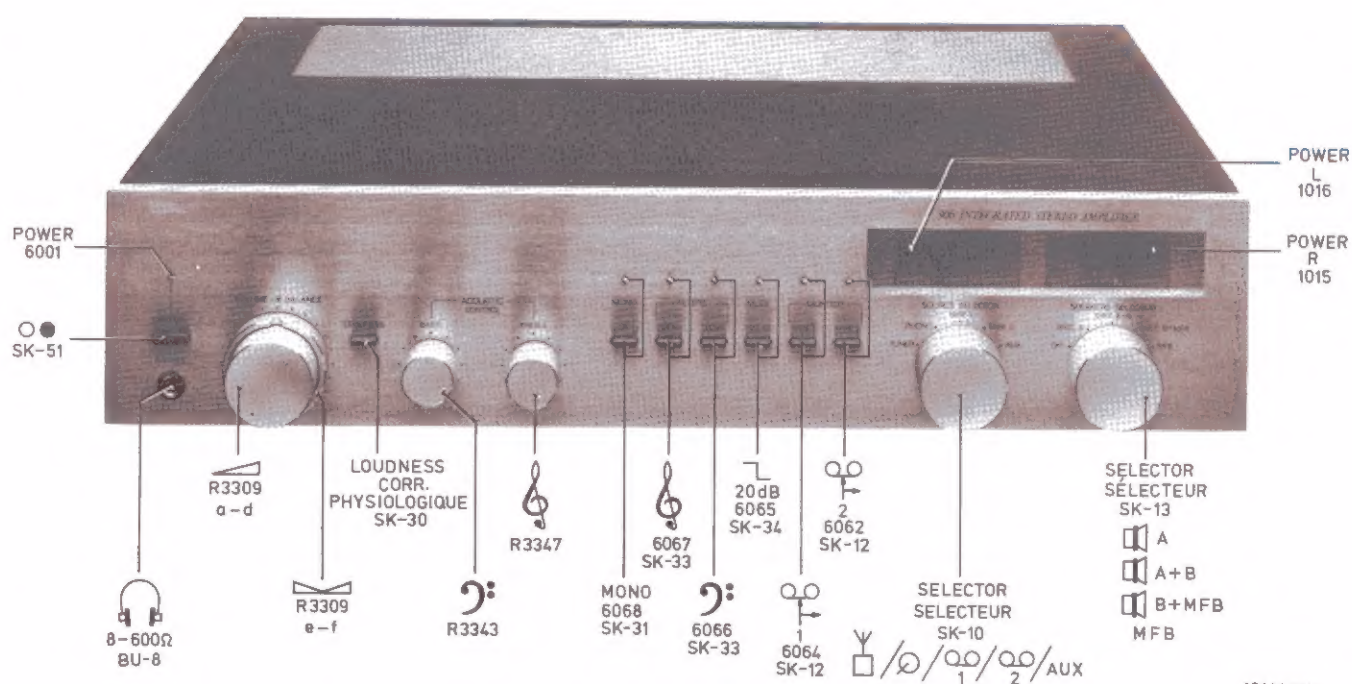
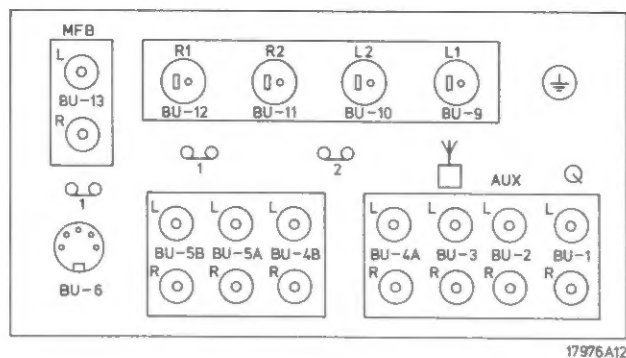


Service
Service
Service

Service Manual





17976A12

| | | | | | | | | | |
|-------|-----|--|--------|--------------------|-------|--|-------|--------------------|-------------------|
| BU-1 | | | 2,5 mV | (47 k Ω) | BU-6 | | 1,4 | 0,25 mV/k Ω | (220 k Ω) |
| BU-2 | AUX | | 150 mV | (100 k Ω) | | | 3,5 | 150 mV | (100 k Ω) |
| BU-3 | | | 150 mV | (100 k Ω) | BU-8 | | | 350 mV | (8 Ω) |
| BU-4A | | | 150 mV | (100 k Ω) | | | 2,5 V | (1 k Ω) | |
| BU-4B | | | 150 mV | (2,5 k Ω) | BU-9 | | L1 | 60 W | (8 Ω) |
| BU-5A | | | 150 mV | (2,5 k Ω) | BU-10 | | L2 | | |
| BU-5B | | | 150 mV | (100 k Ω) | BU-11 | | R2 | | |
| | | | | | BU-12 | | R1 | 60 W | (8 Ω) |

(GB)

For more detailed technical specifications please consult commercial documentation.

(F)

Pour l'obtention de données techniques plus détaillées veuillez consulter la documentation commerciale.

(I)

In modo da ottenere dati tecnici più particolareggiati, vi preghiamo di riferirvi alla documentazione commerciale.

(NL)

Voor meer uitgebreide technische specificaties gelieve de commerciële documentatie te raadplegen.

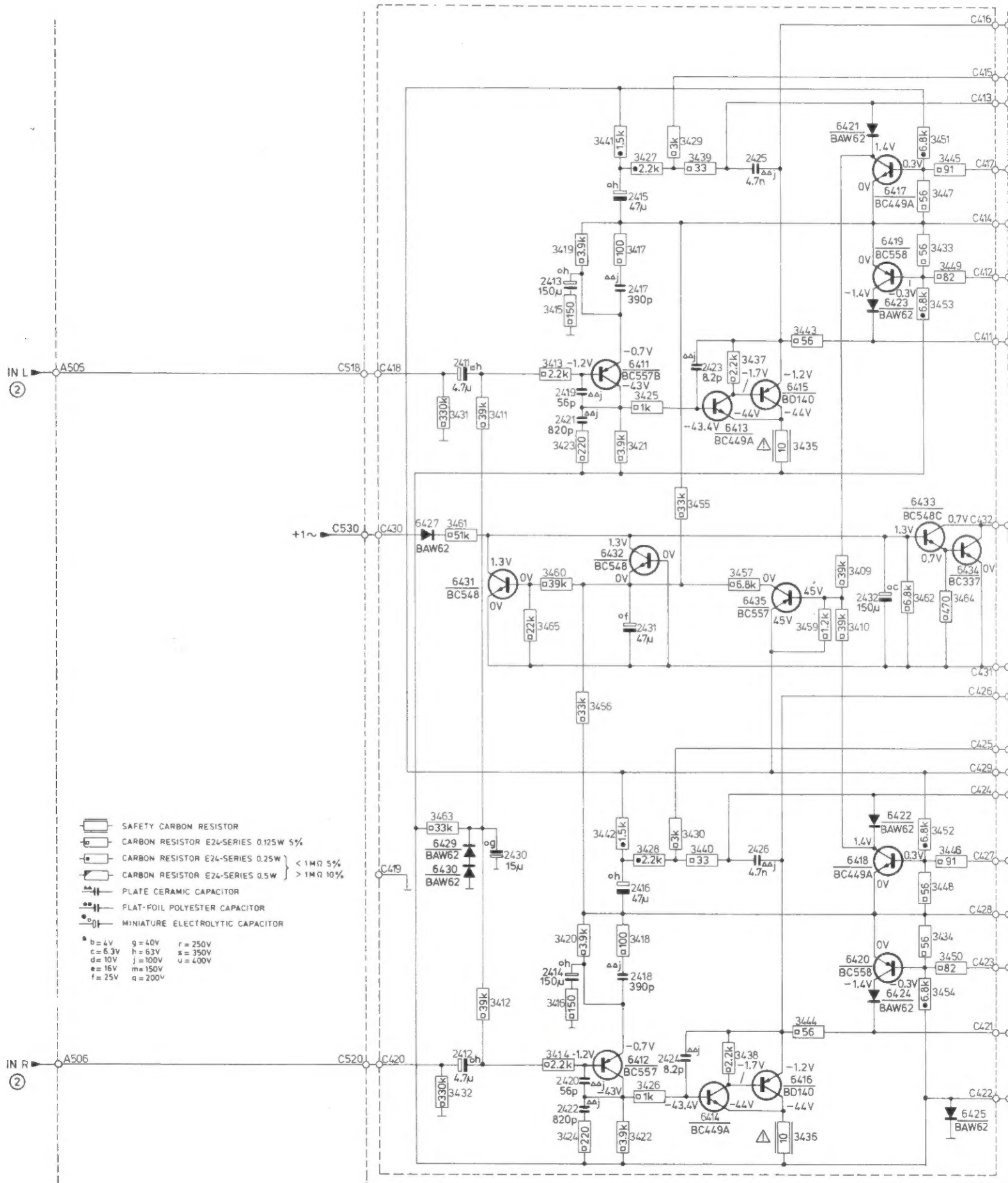
(D)

Für eine mehr detaillierte technische Spezifikation verweisen wir auf die kommerzielle Dokumentation.

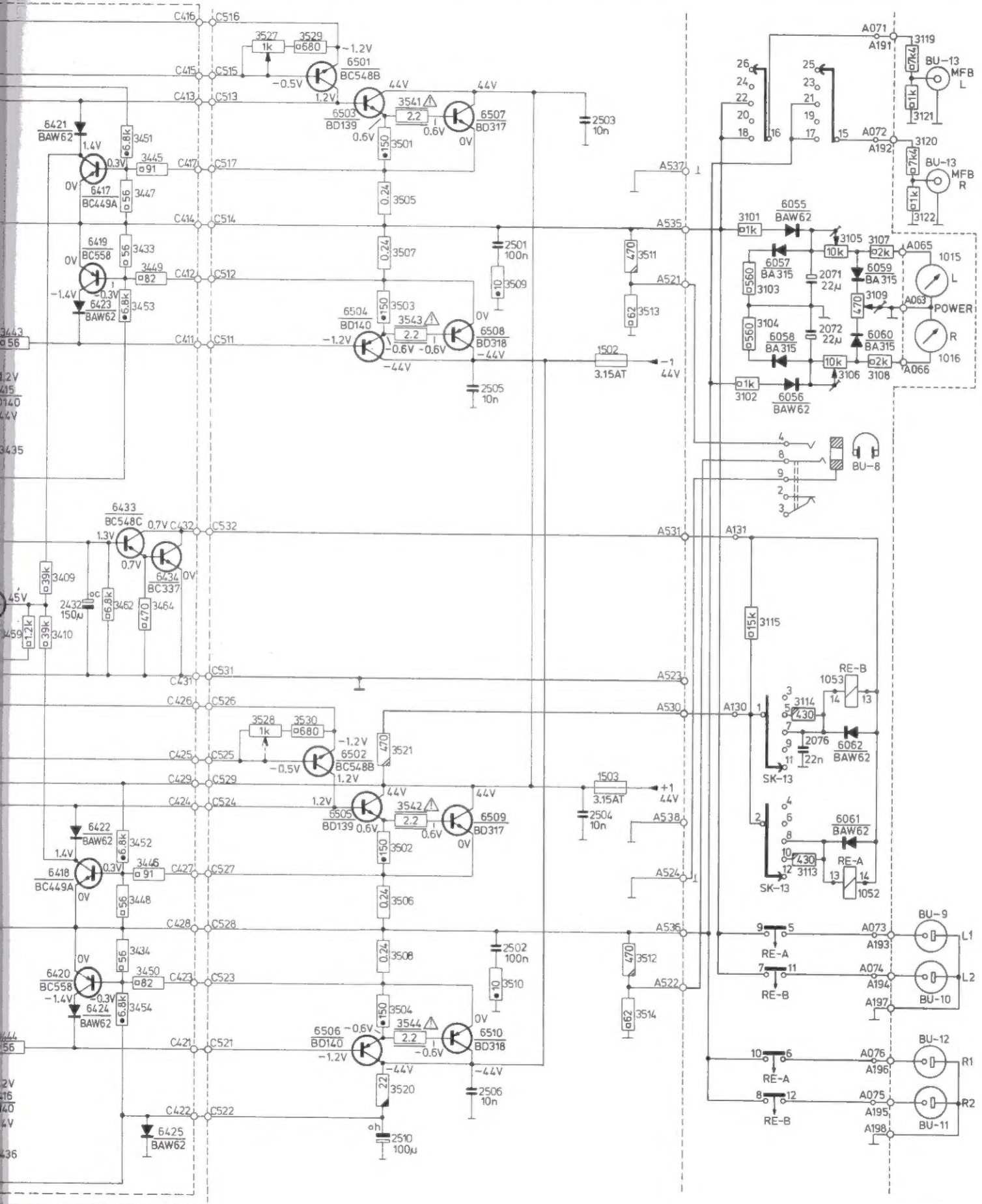
(S)

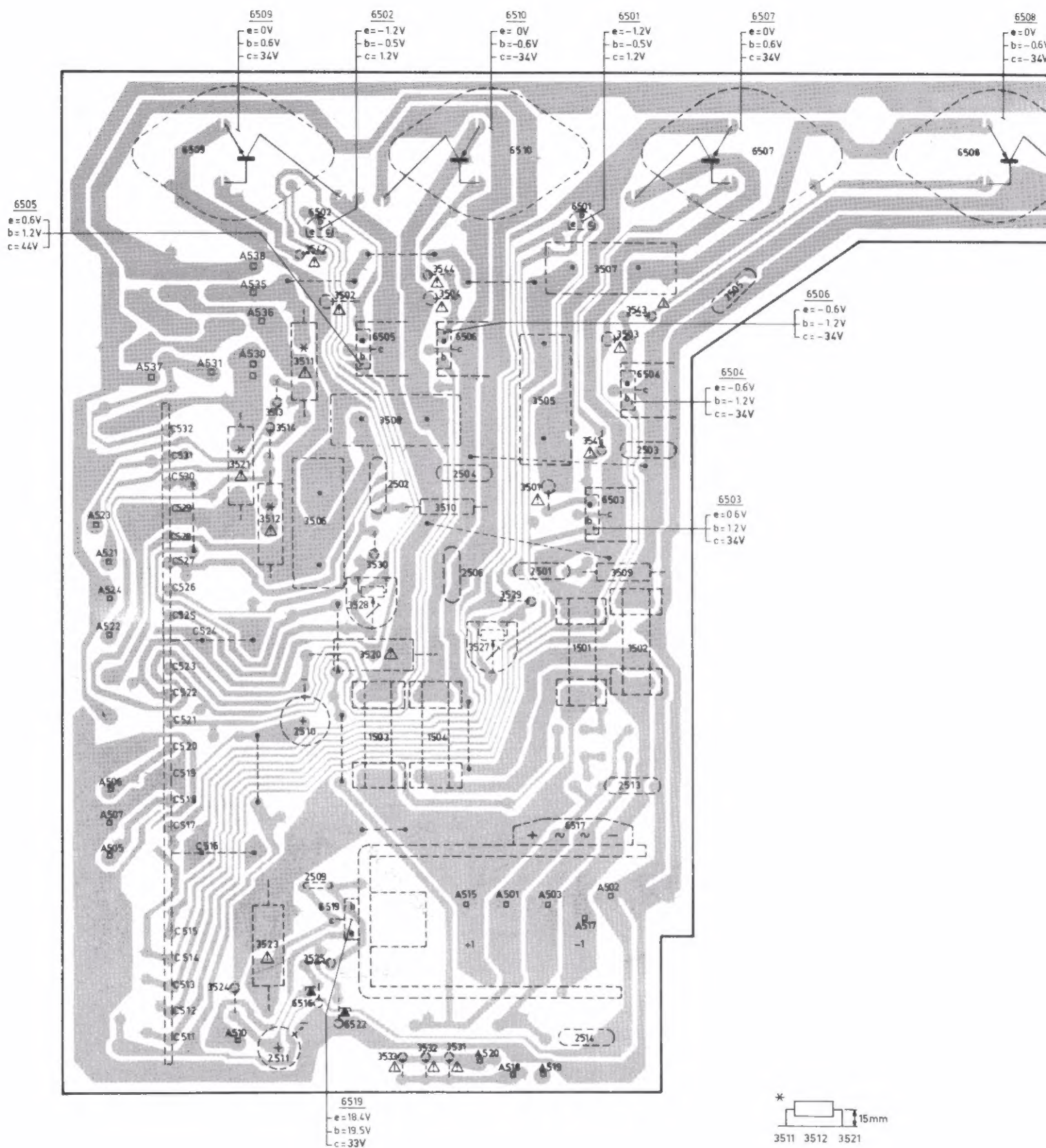
För mera detaljerade tekniska data se kommersiell dokumentation.

| | | | | | | | |
|---|--|---|--------------------------|-----------|------|--------------------------|------|
| M | 6427.6429.6430 | 6431 | 6411.6412.6432 | 6413÷6416 | 6435 | 6421-6425.6417-6420.6433 | 6434 |
| C | 2411.2412 | 2430 | 2413-2422.2431 | 2423÷2426 | | 2432 | |
| R | 3463.3432.3431.3461.3465..411÷3424.3460.3456 | 3455.3425÷3430.3436÷3444.3457.3459.3410.3409.3462 | 3445÷3454.3433.3434.3466 | | | | |

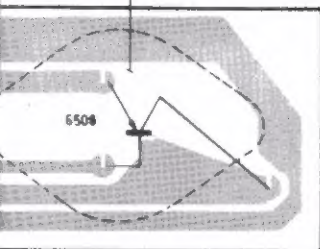


| | | | | |
|--|---|-------------------------------|-------------------------------|-------------------------------|
| 5 6421+6425.6417+6420.6433 6434 | 6501+6506 | 6507+6510 | 1502.1503 | 6055+6058.1053.1052.6059+6062 |
| 2432 | 2510 | 2505.2506.2501.2502 2503.2504 | | 2076.2071.2072 |
| 59.3410.3409.3462 3445+3454.3433.3434.3464 | 3527+3530 3520.3521.3501+3508.3541+3544.3509.3510 | 3511+3514 | 3101+3104.3113+3115.3105+3109 | 3119+3122 |





6508
e=0V
b=-0.6V
c=-34V

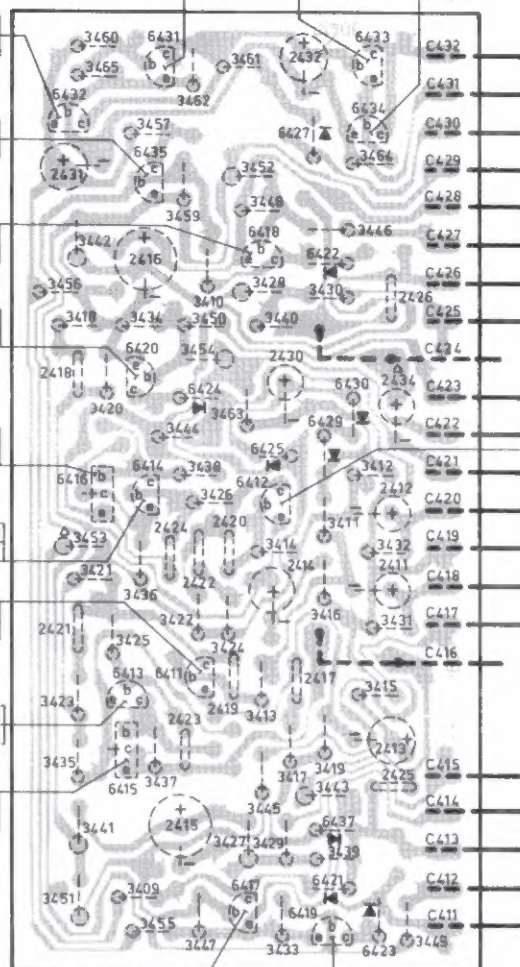


| | | |
|----|----|----|
| 25 | 35 | 65 |
| | | 09 |
| | | 10 |
| | | 07 |
| | | 08 |
| | | 02 |
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| | 42 | |
| | 07 | |
| | 44 | |
| 05 | 04 | |
| | 02 | |
| | 43 | |
| | 03 | 05 |
| | | 06 |
| | 11 | |
| | 05 | 04 |
| | 13 | 15 |
| | 08 | |
| | 14 | |
| | 41 | |
| 03 | 21 | |
| | 07 | |
| 04 | 01 | |
| | 02 | 03 |
| | 10 | |
| | 06 | |
| | 12 | |
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| | 23 | 19 |
| | 25 | |
| | 24 | 18 |
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| | | 22 |
| | 14 | 31 |
| | 11 | 32 |
| | | 33 |
| 25 | 35 | 65 |

17978D12

| MISC | C | R |
|------|------|----------|
| 6431 | 2432 | 3460 |
| 6432 | | 3461 |
| | | 3465 |
| | | 3462 |
| 6432 | 3457 | 6435 |
| 6434 | | e=45V |
| 6427 | | b=45V |
| | | c=0V |
| 6435 | 2431 | 3464 |
| | | 3452 |
| | | 3459 |
| | | 3448 |
| | | 6418 |
| | | e=0V |
| 6418 | 2416 | 3442 |
| 6422 | | b=0.3V |
| | | c=1.4V |
| | 2426 | 3456 |
| | | 3430 |
| | | 3434 |
| | | 3418 |
| | | 3450 |
| | | 3440 |
| 6420 | 2418 | 3454 |
| 6424 | 2430 | 3420 |
| 6430 | 2434 | 3463 |
| | | 3444 |
| 6429 | | 3438 |
| 6425 | | 3412 |
| 6416 | | e=-1.2V |
| 6414 | | b=-1.4V |
| 6412 | | c=-4.4V |
| | 2412 | 3411 |
| | | e=-4.4V |
| | 2420 | 3453 |
| | | b=-4.24V |
| | 2422 | 3414 |
| | | c=-1.7V |
| | 2424 | 3432 |
| | | 3436 |
| | 2411 | 3421 |
| | | e=-0.7V |
| | 2414 | 3416 |
| | | b=-1.2V |
| | 2421 | 3422 |
| | | c=-4.3V |
| 6411 | 2419 | 3425 |
| 6413 | 2417 | 3413 |
| | | 3415 |
| | | 3423 |
| | | e=-4.4V |
| | 2413 | 3419 |
| | | b=-4.33V |
| | 2423 | 3417 |
| | | c=-1.7V |
| 6415 | 2423 | 3437 |
| | | 3435 |
| | 2425 | 3445 |
| | | 3443 |
| | | e=-1.2V |
| | 6437 | 2415 |
| | | b=-1.7V |
| | | c=-4.4V |
| | | 3441 |
| | | 3427 |
| | | 3429 |
| | | 3439 |
| 6421 | | 3409 |
| 6417 | | 3451 |
| 6423 | | 3455 |
| 6419 | | 3447 |
| | | 3433 |
| | | 3449 |

6432
e=0V
b=0V
c=1.3V



6431
e=0V
b=0V
c=1.3V

6433
e=0.7V
b=1.4V
c=0.7V

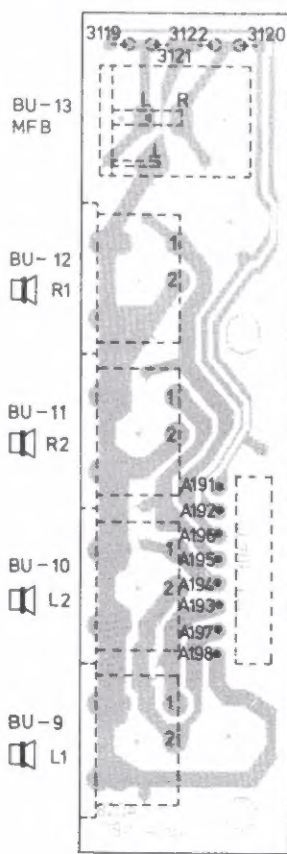
6434
e=0V
b=0.7V
c=0.7V

6412
e=-0.7V
b=-1.2V
c=-4.3V

6417
e=0V
b=0.3V
c=1.4V

6419
e=0V
b=-0.3V
c=-1.4V

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(I)

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- Colleg
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Il relè

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|------------------------|------|-----------------------------------|--------------------|
| | | | |
| 1 kHz (< 250 mV) | BU-3 | BU-9 (L) (BU-12) (R) 2,83 V | 3105 (3106) |
| 1 kHz (< 250 mV) | BU-3 | BU-9 (L) BU-12 (R) 25 V | 3109 |

(GB)

Adjustment output amplifier

Direct current adjustment — Left (Right).

With the aid of R3527 (3523) adjust the quiescent current through the output transistors to $50 \text{ mA} \pm 5\%$.

To be measured with a non-earthed mV-meter connected across the resistors 3505, 3507 (3506, 3508).

The deflection shall then be $24 \text{ mV} \pm 5\%$.

Inspection DC protection

- Connect a resistor of $270 \text{ k}\Omega$ between the negative pole of C2411 and point +1 of the power supply. The relay shall then be released.
- Connect a resistor of $220 \text{ k}\Omega$ between the negative pole of C2414 and point -1 of the power supply. The relay shall then be released.

(F)

Réglage de l'amplificateur de sortie

Ajustage courant continu — gauche (droit).

Par action sur R3527 (3523) régler le courant de repos à travers les transistors de sortie pour avoir $50 \text{ mA} \pm 5\%$.

A mesurer à l'aide d'un mV-mètre isolé de la terre, connecté aux bornes des résistances 3505, 3507 (3506, 3508).

La déviation doit être alors de $24 \text{ mV} \pm 5\%$.

Contrôle de la protection contre le courant continu

- Connecter une résistance de $270 \text{ k}\Omega$ entre le pôle négatif de C2411 et le point +1 de l'alimentation. Ceci fait, le relais doit se décrocher.
- Connecter une résistance de $220 \text{ k}\Omega$ entre le pôle négatif de C2412 et le point -1 de l'alimentation. Ceci fait, le relais doit se décrocher.

(I)

Regolazione dell'amplificatore d'uscita

Regolazione della corrente di riposo canali sinistro (destro).

Per mezzo di R3527 (3523) regolare la corrente di riposo attraverso i transistor d'uscita a $50 \text{ mA} \pm 5\%$.

Questa misura deve essere fatta con il mVometro, senza il collegamento alla presa di terra, ai capi delle resistenze 3505, 3507 (3506, 3508).

La variazione può quindi essere di $24 \text{ mV} \pm 5\%$.

Controllo del circuito di protezione in DC

- Collegare una resistenza di $270 \text{ k}\Omega$ tra il polo negativo di C2411 e il punto +1 dell'alimentazione. Il relè sarà quindi sganciato.
- Collegare una resistenza di $220 \text{ k}\Omega$ tra il polo negativo di C2412 e il punto -1 dell'alimentazione. Il relè sarà quindi sganciato.

(NL)

Afregelen eindversterker

Gelijkstroominstelling — L(R).

De ruststroom door de eindtransistoren moet ingesteld worden met R3527 (3523) op $50 \text{ mA} \pm 5\%$ te meten met een niet geaarde mV-meter aangesloten over de weerstanden 3505, 3507 (3506, 3508).

De uitslag moet dan $24 \text{ mV} \pm 5\%$ zijn.

Controle DC beveiliging

- Sluit een weerstand van $270 \text{ k}\Omega$ aan tussen de - (min pool) van C2411 en de +1 voeding. Het relais moet dan afvallen.
- Sluit een weerstand van $220 \text{ k}\Omega$ aan tussen de - van C2412 en de -1 voeding. Het relais moet dan afvallen.

(D)

Abgleich des Endverstärkers

Gleichstromeinstellung — L(R).

Der Ruhestrom durch die Endtransistoren soll mit R3527 (3523) auf $50 \text{ mA} \pm 5\%$ eingestellt werden; zu messen mit einem nicht-geerdeten mV-Meter, über die Widerstände 3505 und 3507 (3506 und 3508) angeschlossen.

Der Ausschlag soll dann $24 \text{ mV} \pm 5\%$ sein.

Kontrolle der Gleichspannungssicherung

- Einen Widerstand von $270 \text{ k}\Omega$ zwischen Minusleiter von C2411 und +1-Stromversorgung anschliessen. Das Relais soll dann abfallen.
- Einen Widerstand von $220 \text{ k}\Omega$ zwischen Minusleiter von C2412 und -1-Stromversorgung anschliessen. Das Relais soll dann abfallen.






(S)

Inställning av slutsteg

Ställ in vilostömmen för vänster (höger) kanal med hjälp av R3527 (3523) så att den blir $50 \text{ mA} \pm 5\%$ genom sluttransistorerna. Mät med en ickejordad mV-meter över resistorerna 3505, 3507 (3506, 3508). Spänningen skall vara $24 \text{ mV} \pm 5\%$.

Kontroll av DC-skydd

- Anslut en resistor på $270 \text{ k}\Omega$ mellan den negativa polen på C2411 och +1 på nätspanningsaggregatet. Härvid skall reläet lösa ut.
- Anslut en resistor på $220 \text{ k}\Omega$ mellan den negativa polen på C2412 och -1 på nätspanningsaggregatet. Härvid skall reläet lösa ut.

| -TS-  | | |  | | |
|---|---------------------|----------------|--|-----------------------|----------------|
| 6051-6054 | BC559B | 4822 130 44358 | 3009 | 2x100+22K | 4822 102 10145 |
| 6301,6302 | BC559 | 4822 130 40963 | 3337,3338 | Metal res. 330K-2% | 4822 116 51207 |
| 6303,6304 | BC548B | 4822 130 40937 | 3339,3340 | Metal res. 47K-2% | 5322 116 54671 |
| 6305,6306 | BC548 | 4822 130 40938 | 3343,3347 | 2x47K | 4822 102 30313 |
| 6307,6308 | BC558 | 4822 130 40941 | 3435,3436 | Safety 10 Ω | 4822 111 30405 |
| 6411,6412 | BC557B | 4822 130 44568 | 3443,3444 | Safety 56 Ω | 4822 111 30029 |
| 6413,14,17,18 | BC449A | 4822 130 41341 | 3501-3504 | Safety 150 Ω | 4822 111 30156 |
| 6415,6416 | BD140 | 4822 130 40824 | 3505-3508 | W.W.-3W-0.24 Ω | 4822 115 40216 |
| 6419,6420 | BC558 | 4822 130 40941 | 3511-3512 | W.W.-4W- 470 Ω | 4822 110 43098 |
| 6431,6432 | BC548 | 4822 130 40938 | 3521 | Safety 130 Ω | 4822 111 50405 |
| 6433 | BC548C | 4822 130 44196 | 3523 | Safety 22E | 4822 111 50346 |
| 6434 | BC337 | 4822 130 40855 | 3527-3528 | 1K | 4822 100 10037 |
| 6435 | BC557 | 4822 130 44256 | 3532-3533 | Safety 1 Ω | 4822 111 30215 |
| 6501-6502 | BC548B | 4822 130 40937 | 3541-3544 | Safety 5.6 Ω | 4822 111 30435 |
| 6403-6506 | BD139/140 | 4822 130 40849 | | | |
| 6507,6509 | BD317 | 4822 130 41338 | | | |
| 6508,6510 | BD318 | 4822 130 41339 | | | |
| 6519 | BD677 | 5322 209 85451 | | | |
| -D-  | | | -C-  | | |
| 6001 | | 4822 130 31137 | 2001-2002 | 10,000 μ F - 50 V | 4822 124 70319 |
| 6055,6056 | BAW62 | 4822 130 30613 | 2071,2072 | 22 μ F - 40 V | 4822 124 40223 |
| 6061,6062 | | | 2076 | 22 nF | 4822 122 30103 |
| 6057-6060 | BA315 | 4822 130 30843 | 2321,2311 | 82 nF | 4822 121 41158 |
| 6063-6068 | GL-2AR-1 | 4822 130 31137 | 2335,2323 | 10 nF | 4822 121 41134 |
| 6421-6430 | BAW62 | 4822 130 30613 | 2327,2338 | 47 nF | 4822 121 40239 |
| 6515 | BAW62 | 4822 130 30613 | 2419-2420 | 56 pF - 2% | 4822 122 31074 |
| 6516 | BZX79/C20 | 5322 130 34499 | 2423-2424 | 8.2 pF - 2% | 4822 122 31052 |
| 6517,6518 | BY225/200 | 4822 130 50312 | 2501-2502 | 100 n - 100 V | 4822 121 40334 |
| 6522 | BZX79/C22 | 4822 130 34441 | 2503-2506 | 250 V - 47 n | 4822 121 40239 |
| | | | 2512 | 100 n - 250 V | 4822 121 40518 |
| | | | 2513-2514 | 470 n - 100 V | 4822 121 40438 |
| | | | -Miscellaneous- | | |
| | | | 1010-1011 | 6,3 V - 250 mA | 4822 134 40007 |
| | | | 1015 | | 4822 347 10244 |
| | | | 1016 | | 4822 347 10245 |
| | | | 1051 | | 4822 218 10124 |
| | | | 1054,1055 | 6,3 AT | 4822 253 30031 |
| | | | 1502-1503 | 4 AT | 4822 253 30038 |
| | | | 1052-1053 | Relay | 4822 280 70166 |
| -R-  | | | | | |
| 3105,3106 | 10K | 4822 100 10035 | | | |
| 3109 | 470 Ω | 4822 100 10038 | | | |
| 3110 | Safety 56 Ω | 4822 111 30412 | | | |
| 3116,3117 | Safety 1,6 Ω | 4822 111 30471 | | | |
| 3301 | Safety 56 Ω | 4822 111 30412 | | | |

(GB)

Safety regulations require that the set be restored to its original condition and that parts which are identical with those specified, be used.

(NL)

Veiligheidsbepalingen vereisen, dat het apparaat bij reparatie in zijn oorspronkelijke toestand wordt teruggebracht en dat onderdelen, identiek aan de gespecificeerde, worden toegepast.

(F)

Les normes de sécurité exigent que l'appareil soit remis à l'état d'origine et que soient utilisées les pièces de rechange identiques à celles spécifiées.

(D)

Bei jeder Reparatur sind die geltenden Sicherheitsvorschriften zu beachten. Der Originalzustand des Geräts darf nicht verändert werden; für Reparaturen sind Original-Ersatzteile zu verwenden.

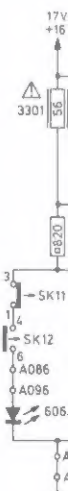
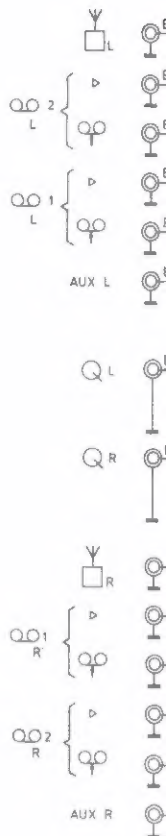
(I)

Le norme di sicurezza esigono che l'apparecchio venga rimesso nelle condizioni originali e che siano utilizzati i pezzi di ricambio identici a quelli specificati.

(S)

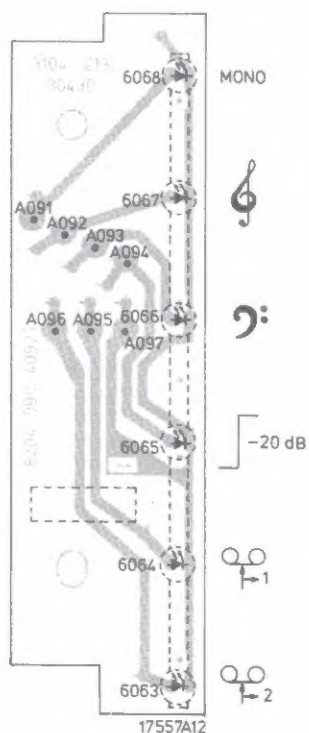
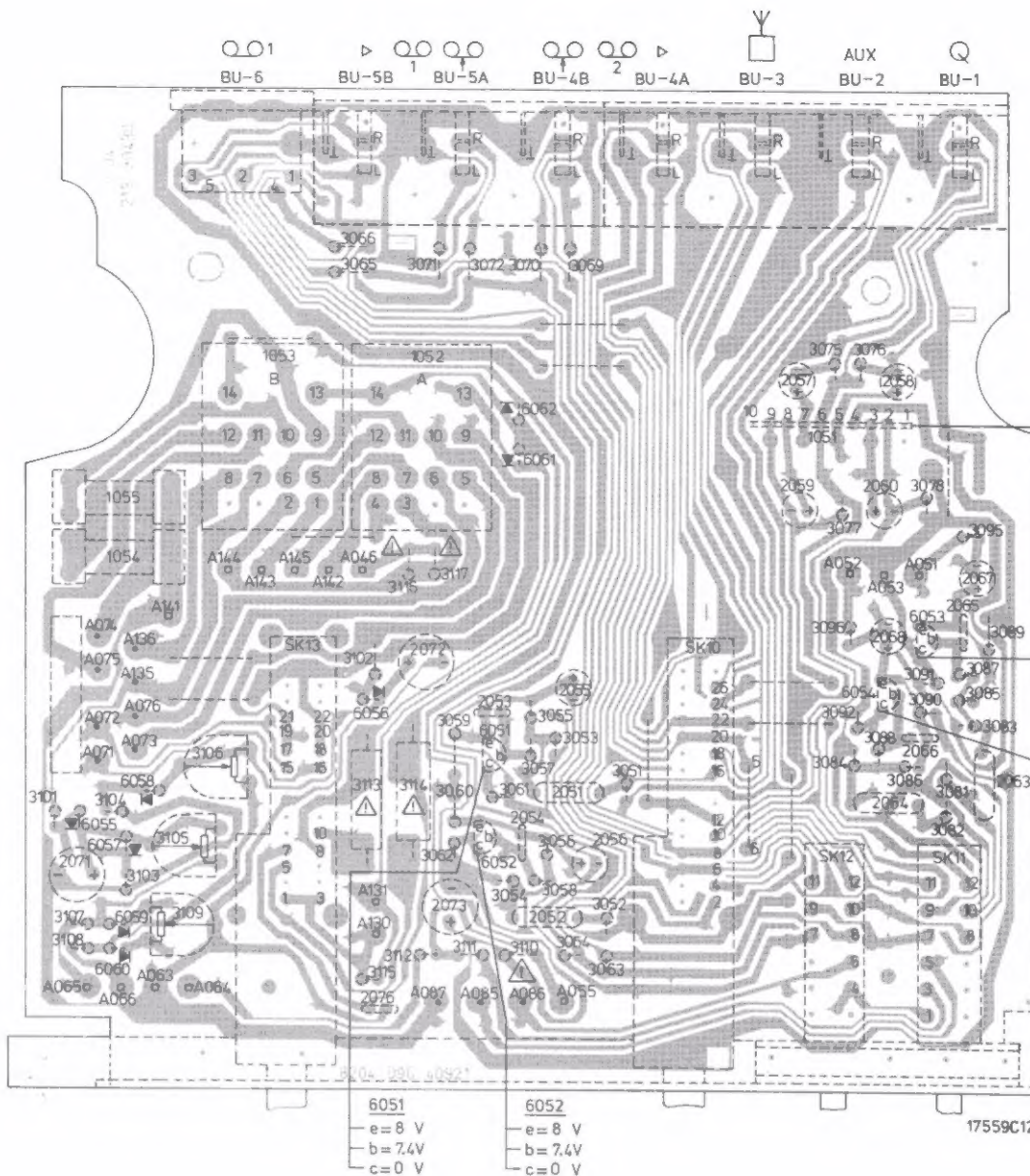
Säkerhetsbestämmelserna kräver att varje reparation skall utföras korrekt med hänsyn till ursprunglig placering av komponenter, ledningar etc. och med användning av föreskrivna reservdelar.

| | |
|-------|-----------|
| MISC. | 6062 |
| C | |
| R | 3301, 311 |



ISC
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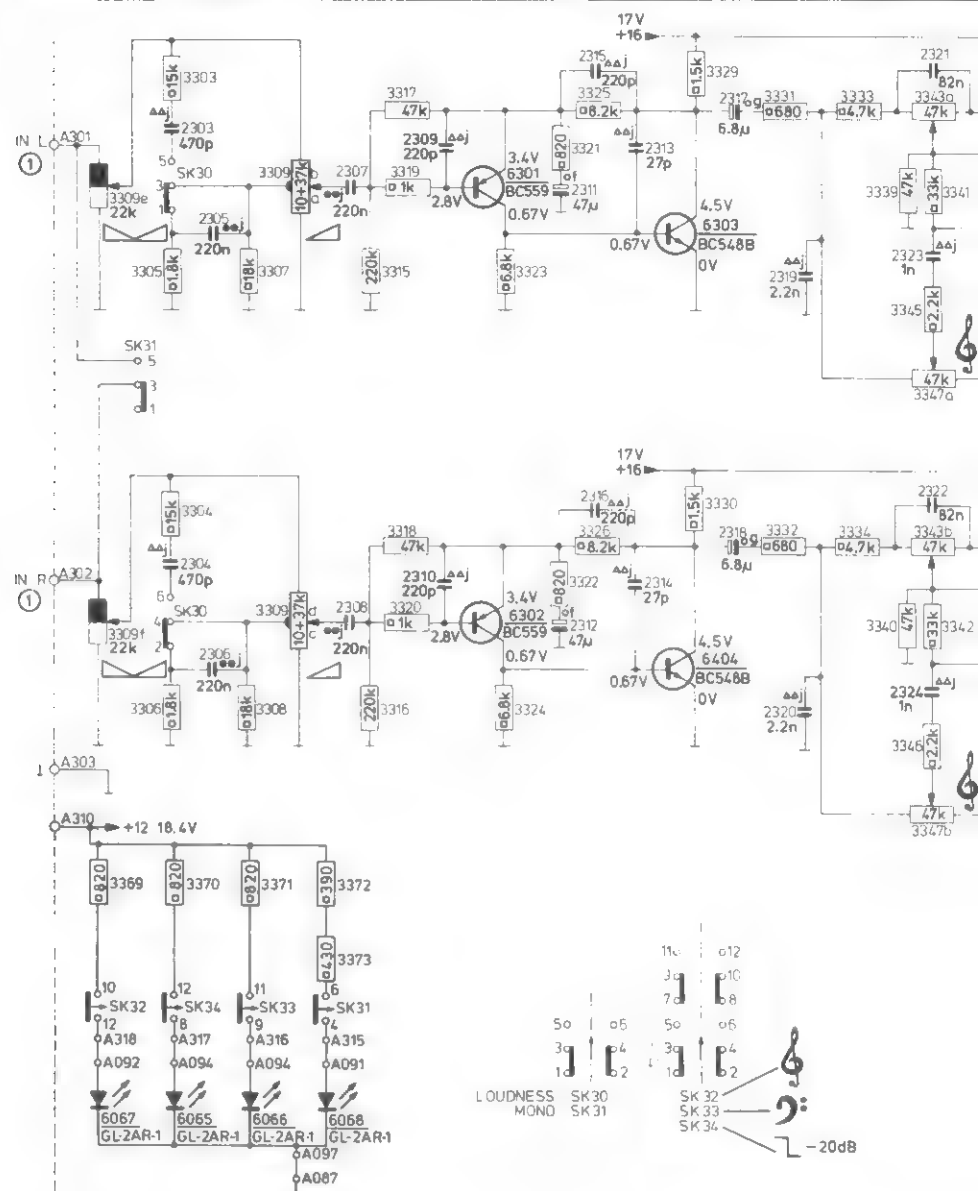
| 20 | 30 | 60 |
|----|------|------|
| 57 | 66 | 72 |
| 58 | 71 | 69 |
| | 70 | |
| | 65 | |
| | 3119 | 3120 |
| | 3121 | 3122 |
| | 75 | 76 |
| | | 62 |
| | | 61 |
| | | 68 |
| 59 | 77 | 78 |
| 60 | 95 | |
| 67 | 3116 | 3117 |
| 65 | | 67 |
| 68 | 96 | 53 |
| 72 | | |
| 55 | 87 | 3102 |
| | 91 | 54 |
| | 85 | 56 |
| 53 | 90 | 55 |
| | 92 | 66 |
| 66 | 83 | |
| | 53 | 51 |
| 63 | 88 | |
| | 84 | 58 |
| | 81 | |
| 51 | 61 | 3106 |
| 64 | 3104 | 55 |
| | 601 | 65 |
| 54 | 3113 | 57 |
| | 56 | 52 |
| 56 | 3105 | |
| 71 | 54 | 58 |
| | 3103 | |
| 73 | 3109 | |
| 52 | 3107 | 59 |
| | | |
| | 3108 | 64 |
| | 3110 | 60 |
| | 3112 | |
| | 3115 | |
| 76 | | |
| | | 63 |



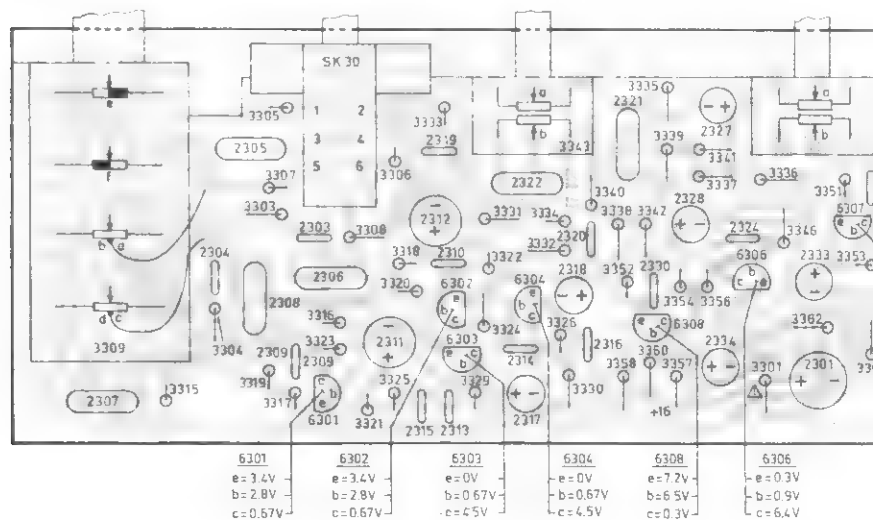
220V
50/60Hz

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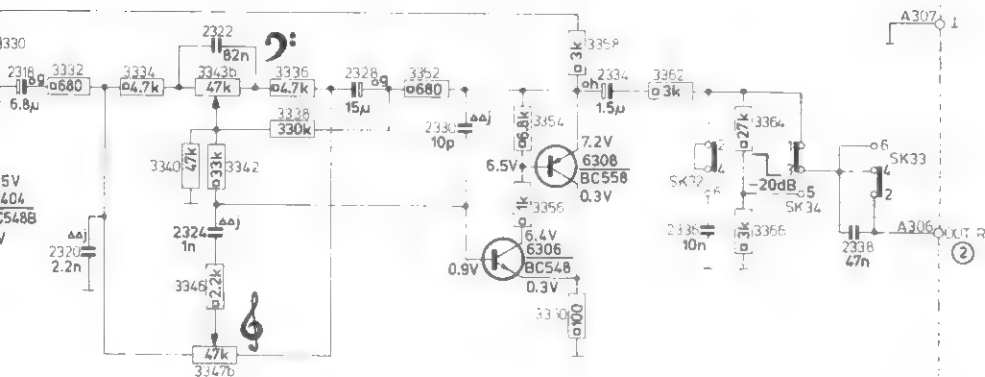
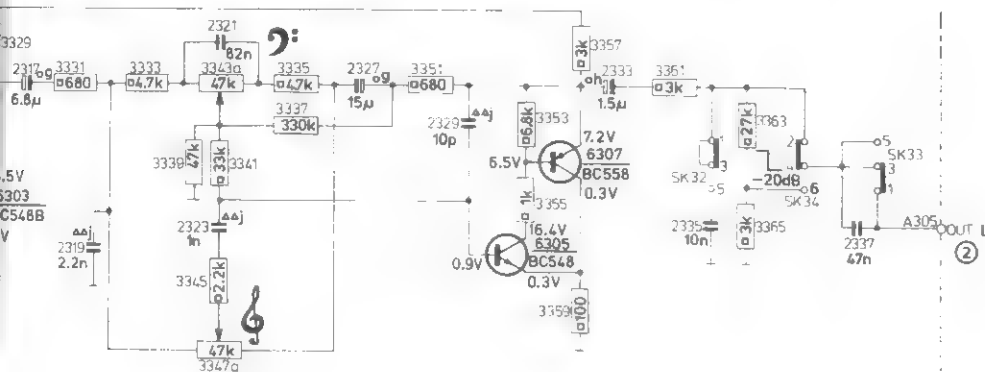
| 6301.6302 | | 6305.6304 | |
|-----------|-----------|-----------|----------------------|
| 2303÷2306 | 2307÷2310 | 2311÷2316 | 2317÷2320 |
| 3303÷3309 | 3315÷2320 | 3321÷3326 | 3329÷3332 |
| | | | 3345÷3347.3333÷3340. |



| MISC | 6301 SK 30 | 6302 6303 | 6304 | 6308 | 6306 | 6307 |
|------|------------|--------------------------|----------------|----------------|---------------------|---------------------|
| C | 2305 | 2303 | 2312 2319 2310 | 2322 | 2320 2321 | 2328 2327 2324 |
| C | 2307 | 2304 2308 2309 2306 2311 | 2315 | 2312 2314 2316 | 2318 | 2330 |
| P | 3309 | 3303 3307 3305 3308 | 3306 | 3331 | 3324 3343 3335 | 3337 |
| R | | 3315 | 3304 3323 3316 | 3321 3325 | 3329 3324 3322 3326 | 3330 3352 3360 3356 |
| | | | | | | 3358 3354 3301 3362 |



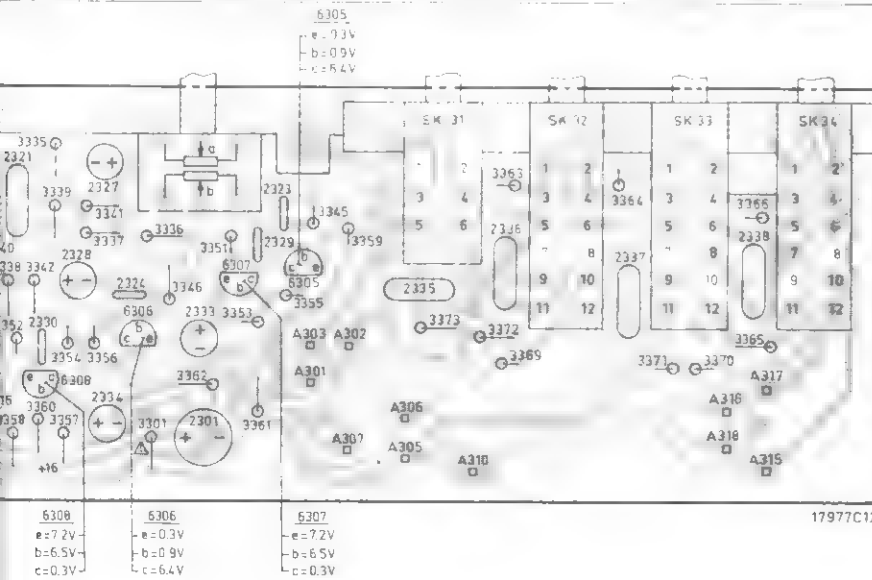
| | | | | | | |
|-----------|-------------------------------|-----------|-----------|-----------|-----------|-----------|
| 3304 | 2317-2320 | 2321-2424 | 2327-2330 | 2333.2334 | 2335.2336 | 2337.2338 |
| 3329-3332 | 3345-3347.3333-3340.3341-3345 | 3351-3356 | 3357-3362 | 3363-3366 | | |



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 008
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 004
 002
 000
 -20dB

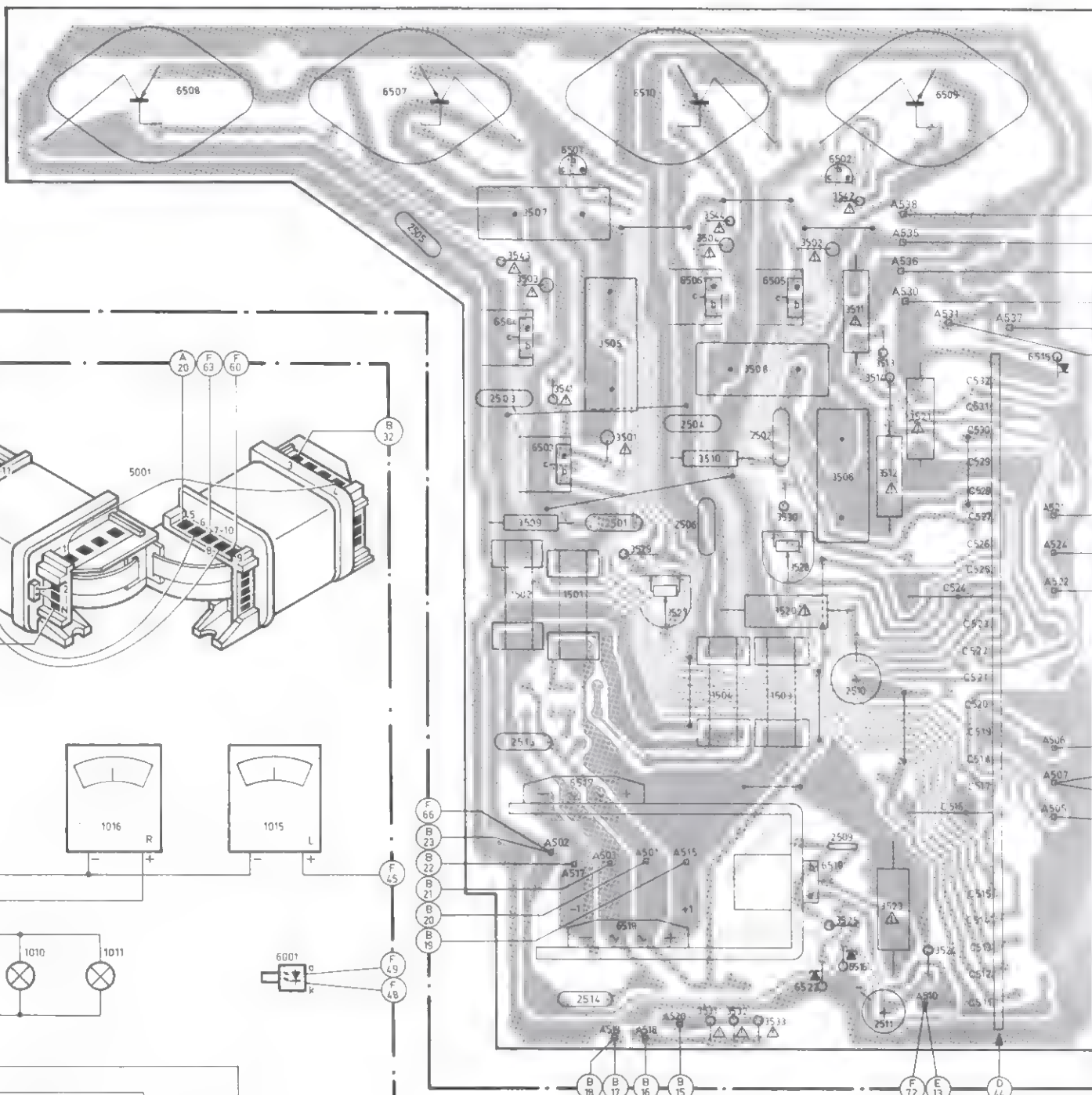
17556D12

| | | | | | | | |
|------|------|------|------|-------|-------|-------|-------|
| 6308 | 6306 | 6307 | 6305 | SK 31 | SK 32 | SK 33 | SK 34 |
| 2321 | 2328 | 2327 | 2324 | 2325 | 2336 | 2337 | 2338 |
| 2330 | 2334 | 2331 | 2333 | | | | |
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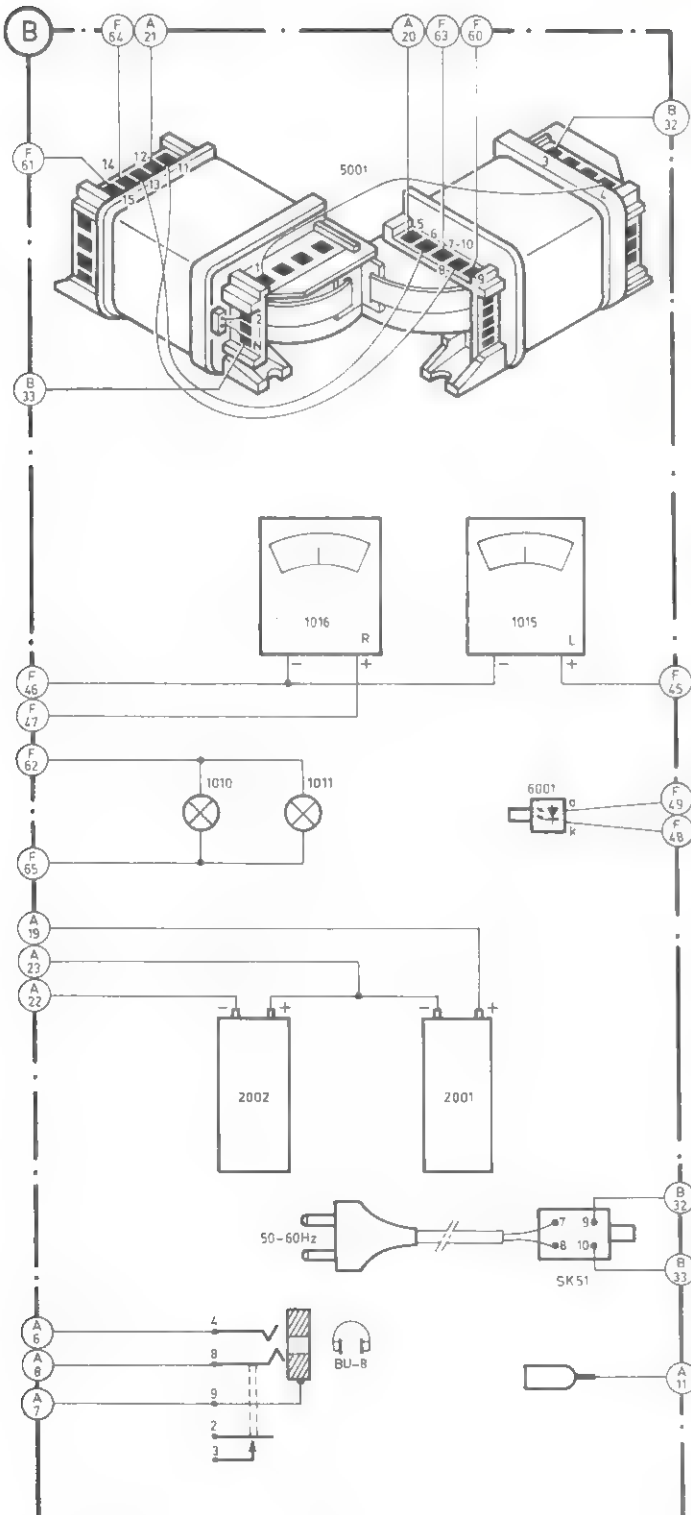


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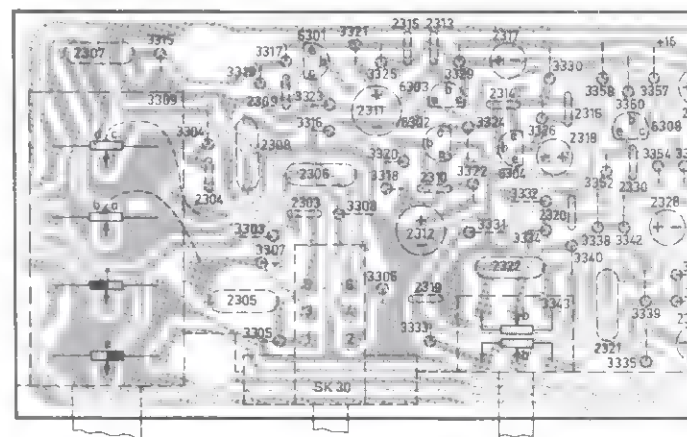
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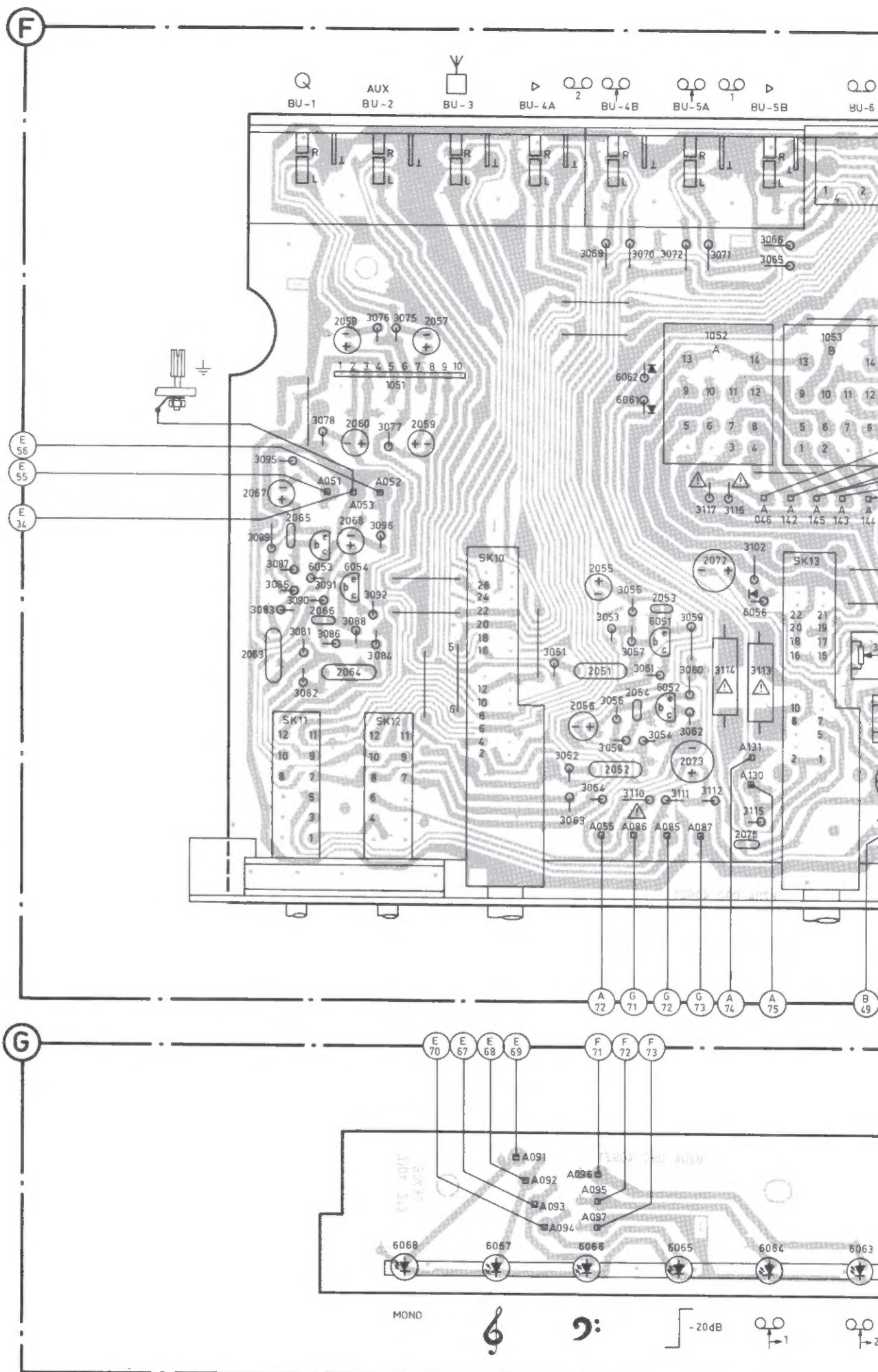


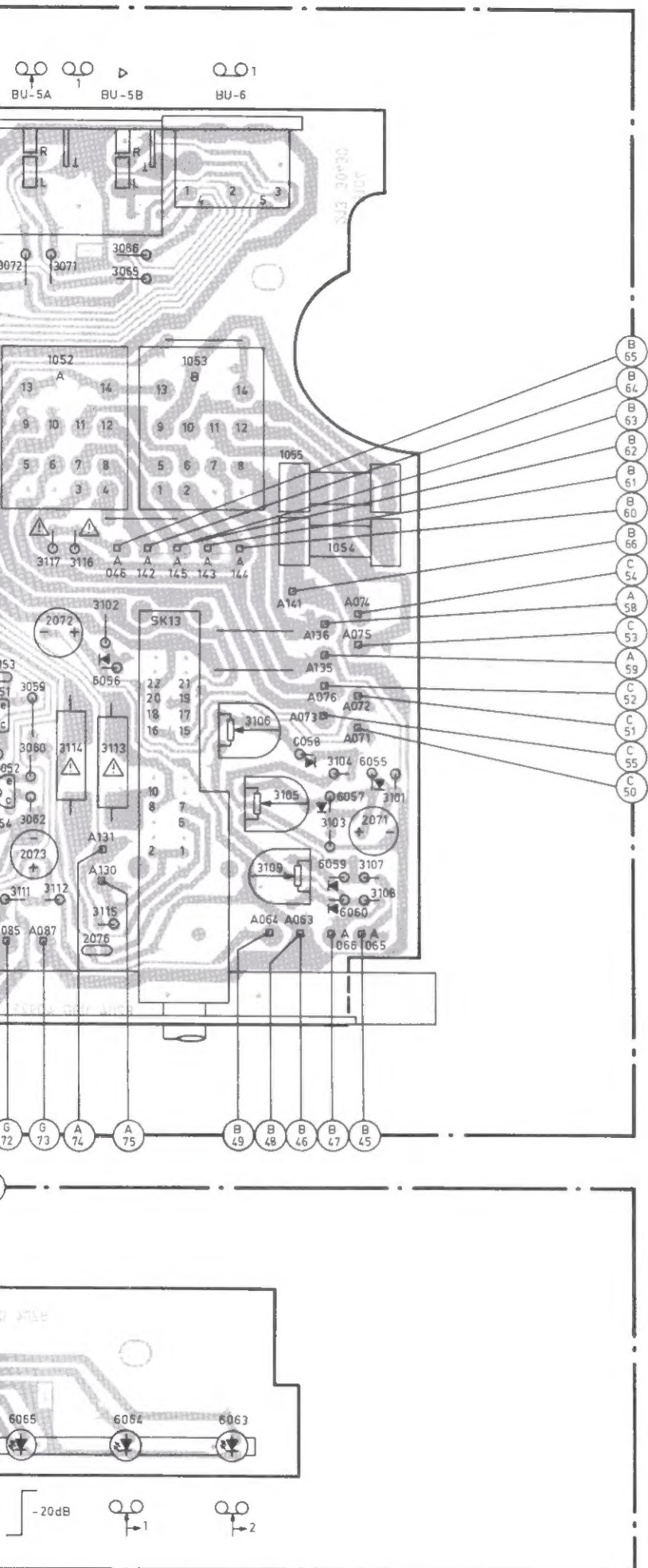
B



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| MISC | C | R |
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| BU-1 ... BU-6 | | |
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| 6062 1051 6061 | | |
| | 2059 2060 | 3078 3077 |
| 1055 | | 3095 |
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| 6053 SK10 SK13 6054 | 2068 2072 2055 | 3096 3089 3102 3087 3085 3055 |
| | 2053 | 3092 3083 |
| 6056 6051 | 2066 | 3090 3088 3053 |
| | 2063 | 3059 3086 3084 3057 3106 |
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| 6057 SK11 SK12 | 2056 2071 | 3056 3105 3101 3101 3103 |
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| 6063 ... 6068 | | |

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| 401 | 4822 256 90295 |
| 402 | 4822 466 70371 |
| 403 | 4822 255 10151 |
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| 407/28 | 4822 426 50386 |
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| 452 | 4822 532 60653 |
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